

# A Review Paper on AWS Product and Services

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## ABSTRACT

AWS is a cloud service provider that manages and maintains the technology infrastructure in a secure environment so the customer can access the cloud resources. The AWS service is provided by the Amazon that uses distributed IT infrastructure to provide different IT resources available on demand. It provides different services such as infrastructure as a service (IaaS), platform as a service (PaaS) and packaged software as a service (SaaS). It is a cloud computing platform which is globally available. A large enterprise spread across the globe can utilize the AWS to deliver the training to the distributed workforce. APN is a global partner program that helps partners use the AWS to build their businesses.

**KEYWORDS:** AWS, Cloud, Security, Networking, hardware, IP addresses

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## I. INTRODUCTION

**Amazon Web Services (AWS)** is a subsidiary of Amazon providing on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis. These cloud computing web services provide a spread of basic abstract technical infrastructure and distributed computing building blocks and tools. One of the most well-known of these services is Amazon Elastic Compute Cloud (EC2), which allows users to possess at their disposal a virtual cluster of computers, available all the time, through the online. AWS's version of virtual computers emulates most of the attributes of a true computer, including hardware central processing units (CPUs) and graphics processing units (GPUs) for processing; local/RAM memory; hard-disk/SSD storage; a choice of operating systems; networking; and pre-loaded application software like web servers, databases, and customer relationship management (CRM). AWS provides services to customers when required with none prior commitment or upfront investment.

Pay-As-You-Go enables the customers to procure services from AWS.

- Computing
- Programming models
- Database storage
- Networking



Figure 1 Pay As You Go

## II. CLOUD COMPUTING:

Cloud computing is that the on-demand availability of computing system resources, especially data storage (cloud storage) and computing power, without direct active management by the user. Cloud computing is usually referred to as delivery of computing services including servers, storage, databases, and intelligence over the net. The term is mostly accustomed describe data centers available to several users over the web. Large clouds, predominant today, often have functions distributed over multiple locations from central servers. If the connection to the user is comparatively close, it's going to be designated a foothold server. Cloud providers typically use a "pay-as-you-go" model, which might result in unexpected operating expenses if administrators aren't familiarized with cloud-pricing models. The availability of high-capacity networks, low-cost computers and storage devices moreover because

the widespread adoption of hardware virtualization, service-oriented architecture and autonomic and utility computing has led to growth in cloud computing. As of 2017, most cloud computers run a Linux-based software.

### III. AWS WELL-ARCHITECTED:

The AWS Well-Architected Framework helps you understand the pros and cons of choices you create while building systems on AWS. By using the Framework you'll learn architectural best practices for designing and operating reliable, secure, efficient, and cost-effective systems within the cloud. It provides how for you to consistently measure your architectures against best practices and identify areas for improvement. the method for reviewing an architecture could be a constructive conversation about architectural decisions, and isn't an audit mechanism. We believe that having well-architected systems greatly increases the likelihood of business success. AWS Solutions Architects have years of experience architecting solutions across a good type of business verticals and use cases. we've helped design and review thousands of customers' architectures on AWS. From this experience, we've got identified best practices and core strategies for architecting systems within the cloud.

#### The Five Pillars of the Framework



Figure 2 Pillars of AWS Well-Architected

#### 1. Operational Excellence

The Operational Excellence pillar includes the flexibility to support development and run workloads effectively, gain insight into their operations, and to continuously improve supporting processes and procedures to deliver business value.

#### 2. Security

The Security pillar includes the protection pillar encompasses the power to safeguard data, systems, and assets to require advantage of cloud technologies to boost your security.

#### 3. Reliability

The Reliability pillar includes the reliability pillar encompasses the power of a workload to perform its intended function correctly and consistently when it's expected to.

#### 4. Performance Efficiency

The Performance Efficiency pillar includes the power to use computing resources efficiently to fulfill system requirements, and to keep up that efficiency as demand changes and technologies evolve.

### 5. Cost Optimization

The Cost Optimization pillar includes the flexibility to run systems to deliver business value at very cheap price point.

### IV. PRODUCT AND SERVICES:

AWS has several building block infrastructure services in the compute, storage, database, Security, Management, and Networking.

AWS customers use there's products and services to power a wide variety of workload and applications including web and mobile apps, data processing, storage and warehousing

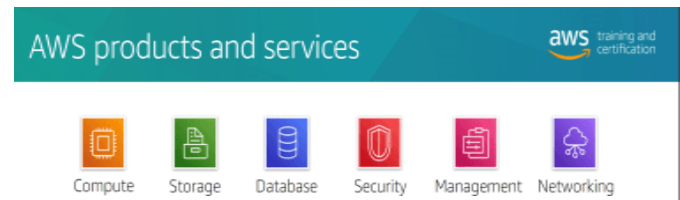


Figure 3 AWS Products and Services

#### A. Compute Services

It allows customer to develop, deploy, run and scale workloads in AWS Cloud



Figure 4 Compute Services

#### 1. Amazon EC2 (Amazon Elastic Compute Cloud)

It is a web services that provides secure, resizable compute capacity in the cloud.

Compute capacity refers to the functionality that is traditionally provided by on premises physical or virtual servers.

#### 2. Auto Scaling

Customers can maintain the health and availability of their applications by setting triggers to automatically increase or decreases the number of instances in their deployments

#### 3. Elastic Load Balancing

It is automatically distributes incoming application traffics across multiple targets, such as Amazon EC2 instances, containers, IP addresses and Lambda Function.

#### 4. AWS Lambda

It is a compute service that runs code in response to events and automatically manages the computer resources for your customers.

#### 5. Amazon EC2 Container Service (ECS)

It is a highly scalable, high performance container management services that supports Docker containers and allows customers to easily run applications on a managed cluster of Amazon EC2 instances.

#### B. Storage Services

It is reliable, scalable and secure place of data



**Figure 5 Storage Service**

### 1. Amazon S3

Amazon S3 is a storage for the internet that is designed to make web scale computing easier for developers.

### 2. Amazon EBS

It is a hard drive Customer can create partitions on it, format it and boot their operating systems off it.

Amazon EBS provides persistency block level storage volumes for use with Amazon EC2 instances in the AWS cloud.

### 3. Amazon S3 Glacier

It is a storage services that provides secure and durable storage for data archiving and backup.

### 4. AWS Storage Gateway

It is a service connecting an on premises software appliance with cloud based storage to provide seamless and secure integration between an organization on premises IT environment and the AWS storage infrastructure so that large amounts of data can be transferred into and out of AWS cloud

### 5. Amazon EFS (Elastic File System)

It is a file storage services for amazon ec2 instances.

It is easy to use and provides a simple interface for creating and configuring file systems.

### C. Database Services

It is built for specific application use cases. It handles time consuming database management tasks such as backup, patch management and replication



**Figure 6 Database Services**

### 1. Amazon Relational Database Services (RDS)

Amazon RDS is a managed relational database services with a choice of six popular database i.e. Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle Database and SQL Server.

### 2. Amazon Aurora

It is a MySQL and PostgreSQL Compatible relations database built for the cloud that combines the performance and availability of traditional enterprise database with the simplicity and cost effectiveness of open source database.

It is fully managed by Amazon RDS.

### 3. Amazon Dynamo DB

It is a key value and document databases that delivers single digit millisecond performance at any scale.

### 4. Amazon ElastiCache

It is a caching service that makes it easy to deploy, operates and scale an in memory caches in the cloud

It improves the performance of web application by allowing customers to retrieve information from a fast, managed , in-memory caching system instead of relying entirely on slower disk based databases.

### D. Security Services

It is use for Encryption, Access Management and securing regulated workloads



**Figure 7 Security Service**

### 1. AWS IAM (AWS Identity and Access Management)

Enables customers to securely control access to AWS services and resources for their users.

IAM enables business to create and manages users in AWS.

### 2. AWS Directory Services

It managed services that allows customer to connect their AWS resources with an existing on - premises Microsoft Active Directory or to set up new standalone directory in the AWS cloud

### 3. AWS Cloud HSM

It helps costumes meet corporate, contractual and regulatory compliance requirements for data security by using dedicated hardware security module or HSM appliances in the AWS cloud.

### E. Management Services

Complete control for your cloud environment



**Figure 8 Management Services**

### 1. Amazon Cloud Watch

It provides monitoring for AWS cloud resources and application that customers run on AWS.

It \*It monitors system metrics such as CPU and network usage along with custom metrics such as page load or query execution time.

### 2. AWS Cloud Trail

It enables governance, compliance, operational auditing and risk auditing of your customers accounts.



Customers can use Cloud Trail to log, continuously monitor and retain account activity related to action across their AWS infrastructures.

### 3. AWS System Manager

It gives your customer visibility and control of their infrastructure on AWS.

From a unified user interface they can view Operational data from multiplier AWS services and automate operational tasks across their AWS resources.

### 4. AWS Cloud Formation

It provides a common language for customers to describe and provision all the infrastructure resources in their cloud environments.

### 5. AWS Auto Scaling

Monitors applications and automatically adjust capacity to maintain steady, predictable performances.

### F. Networking Services

Isolate cloud infrastructure and scale request handling capacity



Figure 9 Networking Services

#### 1. Amazon VPC (Virtual Private Cloud)

It enables customer to build a virtual network in the AWS cloud.

Customer can provision a private isolated section of the network into which they can deploy resources.

#### 2. AWS Direct Connect

It is a private connection between a customers data center and AWS.

This links their internal networking to an AWS direct Connect location over a standard 1-gigabit or 10 gigabit Ethernet fiber optic cable.

#### 3. Amazon Route 53

It is highly scalable DNS service that routed end users to internet application by translating human readable names into numeric IP addresses like 192.0.2.1 which computers use to connect to each other

### V. Advantages and Disadvantages of AWS Services

#### Advantages:

- It offers easy to affix up process and simple to use UI (User Interface) or Management Console. Moreover all the AWS services are well documented for beginners.
- It offers simple billing with dynamic options as per need including per hour billing, region specific pricing, term specific pricing etc.
- Amazon is trusted vendor and ensures stability of services.

- AWS services are available at global scale which covers about 15 regions which include US, Europe and Asia pacific. There are multiple availability zones in each of these regions. Moreover it offers massive data centres.

#### Disadvantages:

- There are limits on resources available on Amazon EC2 and Amazon VPC console. However one can request to increase the identical.
- There are limitations on security measures. as an example, EC-2 classic supports max. 500 per instance and each group supports max. of 100 permissions. Moreover EC2 VPC supports max. 100 groups per VPC.
- There's technical support fees which vary as per different packages which include developers, businesses and enterprises.
- There are generic cloud computing drawbacks like internet dependency, security concerns then on, refer disadvantages of Cloud Computing

### VI. CONCLUSION:

The AWS Well-Architected Framework provides architectural best practices across the five pillars for designing and operating reliable, secure, efficient, and cost-effective systems within the cloud. The Framework provides a collection of questions that permits you to review an existing or proposed architecture. It also provides a group of AWS best practices for every pillar. Using the Framework in your architecture will facilitate your produce stable and efficient systems, which permit you to specialise in your functional requirements. Cloud storage may be a critical component of cloud computing because it holds the data employed by applications. Big data analytics, data warehouses, Internet of Things (IoT), databases, and backup and archive applications all depend on some style of data storage architecture. Cloud storage is often more reliable, scalable, and secure than traditional on-premises storage systems. AWS offers an entire range of cloud storage services to support both application and archival compliance requirements.

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